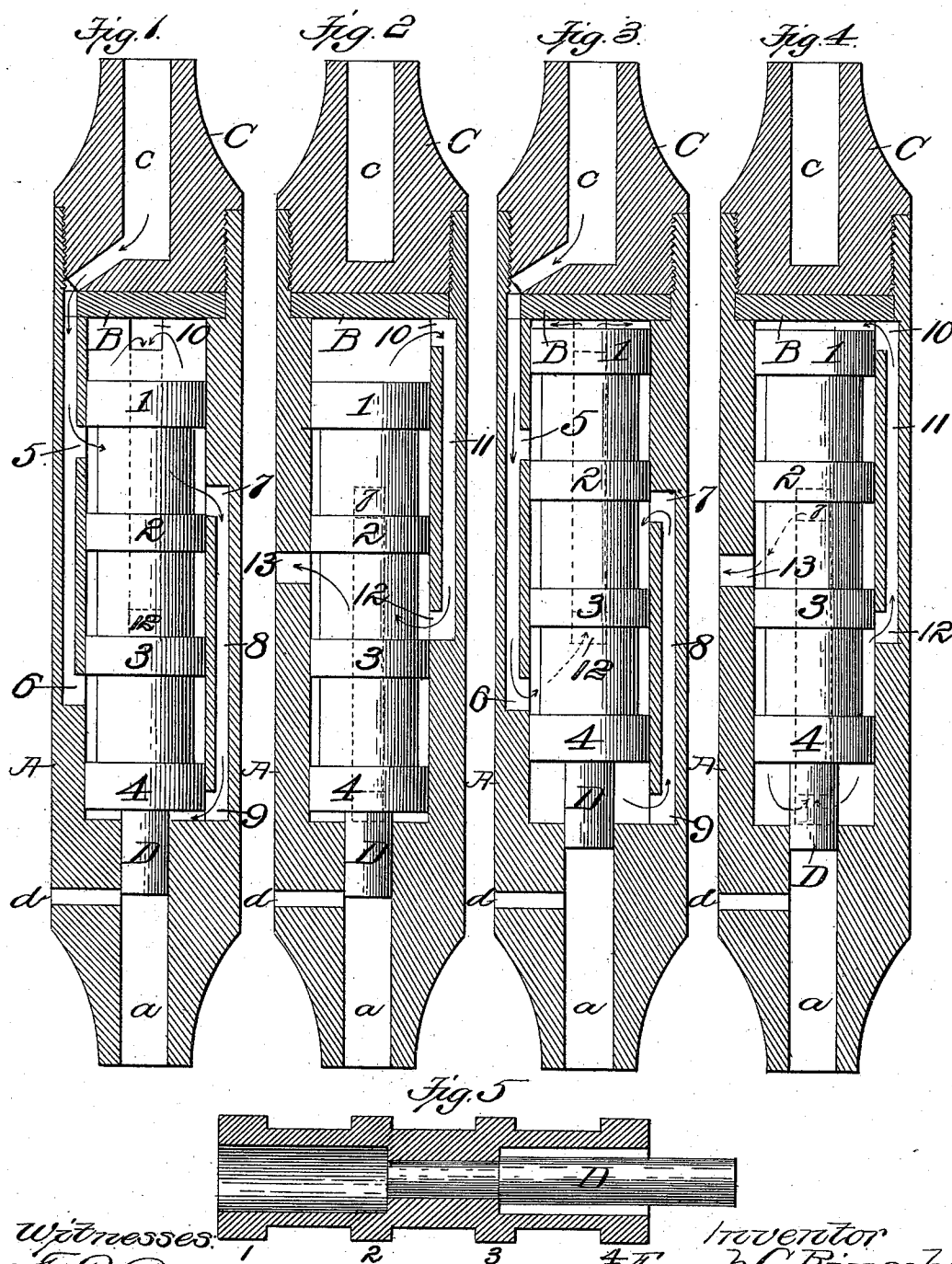


(No Model.)

F. C. RINSCHÉ.
ENGINE.

No. 535,463.

Patented Mar. 12, 1895.



Witnesses:
F. R. Cornwall
Hugh H. Wagner

Inventor
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UNITED STATES PATENT OFFICE.

FRANK C. RINSCHÉ, OF ST. LOUIS, MISSOURI, ASSIGNOR TO PIERRE CHOUTEAU, OF SAME PLACE.

ENGINE.

SPECIFICATION forming part of Letters Patent No. 535,463, dated March 12, 1895.

Application filed December 18, 1894. Serial No. 532,193. (No model.)

To all whom it may concern:

Be it known that I, FRANK C. RINSCHÉ, a citizen of the United States, residing at the city of St. Louis, State of Missouri, have invented a certain new and useful Improvement in Engines, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification, wherein—

Figure 1 is a longitudinal sectional view, illustrating my improved engine and showing the piston thereof at its lowest position. Fig. 2 is a similar view, the plane of section of which is at right angles to the section shown in Fig. 1. Fig. 3 is a sectional view taken on the same plane as Fig. 1, the piston being shown in an elevated position. Fig. 4 is a sectional view taken on the same plane as a section in Fig. 2, the piston being shown in an elevated position. Fig. 5 is a longitudinal sectional view through the piston.

This invention relates to a new and useful improvement in engines, of that class which is especially designed to be operated by compressed air.

The essential features of this invention are: the construction of the piston; the arrangement of the ports leading to and from the cylinder; and the combination of the several parts comprising my engine, all as will hereinafter be described and afterward pointed out in the claims.

In the drawings A indicates a cylinder which is formed with a tool shank opening *a* in its end, adapted to receive the shank of the tool, which tool is acted upon by the stem of the piston which projects thereinto.

B indicates a face-plate which is received on a shoulder formed in the upper end of the cylinder A, said face-plate being held in position by a cap C which is screwed into the end of the cylinder. An inlet port *c* is formed in this cap for the admission of the motive fluid to the engine. The piston which operates in the cylinder A, is formed hollow at each end, the central web affording a seat for a stem D which projects down into the tool shank opening. This piston is formed with four heads 1, 2, 3, and 4 between which are reduced portions. The inlet port *c* connects with a port opening into the cylinder at points 5 and 6.

When the piston is in the position shown in Fig. 1, the motive fluid, not finding escape through the opening 6 will pass through opening 5, between heads 1 and 2 on the piston, into opening 7 through port 8, and opening 9, to a point beneath the cylinder. At the same time the space above the piston is being exhausted (see Fig. 2) by the fluid contained therein passing through opening 10, port 11, opening 12, between heads 2 and 3 on the piston, and out exhaust port 13. This will cause the piston to rise, and in so doing, head 3 will get above opening 12 (as shown in Fig. 3) and establish communication between the inlet port 6, through the space between the heads 3 and 4 on the piston, opening 12, port 11, and opening 10, into the space above the piston. Coincidentally, the head 2 is also carried above opening 7, shutting off inlet port 5, and exhausting the fluid from beneath the piston, through opening 9, port 8, opening 7, between heads 2 and 3 of the piston, and exhaust port 13.

It will be noticed that heads 2 and 3 of the piston are the only active heads in opening inlet or exhaust communications, and that heads 1 and 4 define paths from the inlet ports 5 and 6 to the receiving ports 7 and 12 respectively, said heads 1 and 4 also forming end walls for the spaces above and below the piston. As the piston is carried part of its stroke by expansion and momentum, it will be seen that the recesses in the ends thereof are very desirable.

At the lowest point of movement of the stem D, I form an opening *d* running from the tool shank opening to the exterior. The object of this is, to prevent the formation of a partial vacuum between the stem and tool shank, as the piston makes too rapid a stroke to permit the tool shank following.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In an engine, the combination with the cylinder formed with inlet ports opening at points 5 and 6, port 8 opening into the cylinder at points 7 and 9, port 11 opening into the cylinder at points 10 and 12, and exhaust port 13 leading from the cylinder between openings 7 and 12; and a piston formed with four

heads co-operating with said port-openings and exhaust port, substantially as described.

2. In an engine, the combination with a cylinder formed with inlet port opening there-
5 into at points 5 and 6, port 8 opening into the cylinder at points 7 and 9, port 11 opening into the cylinder at points 10 and 12, exhaust port 13, a tool shank opening in the end of the cylinder, port *d* leading therefrom; a pis-
10 ton formed with four heads, said piston being

recessed at its ends, and a stem on said piston which projects down into the tool shank opening, substantially as described.

In testimony whereof I hereunto affix my signature, in presence of two witnesses, this 15
14th day of December, 1894.

FRANK C. RINSCHÉ.

Witnesses:

F. R. CORNWALL,
HUGH K. WAGNER.